UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* MASATOSHI YOKOTA

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Appeal 2008-3413
Application 10/601,652
Technology Center 3700

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Decided: October 1, 2008

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Before RICHARD E. SCHAFER, MICHAEL P. TIERNEY and JAMES T. MOORE, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* JAMES T. MOORE.

Opinion Concurring filed by *Administrative Patent Judge* RICHARD E. SCHAFER.

MOORE, *Administrative Patent Judge*.

DECISION ON APPEAL

## STATEMENT OF CASE

The Appellant appeals under 35 U.S.C. § 134 (2002) from a final rejection of claims 1, 2, 4, 6, 7, 9 and 11-16.[1] We have jurisdiction under 35 U.S.C. § 6(b) (2002).

The Appellant's claims are directed to a golf ball and a method for producing a golf ball.[2] The ball is said to have excellent controllability, shot feeling, durability, and flight distance (Spec., 1:6-7). This is said to be due to the inventor's discovery of the relationship between the hardness and the stiffness of the cover material of the ball. (Spec., 3:2-17).

Claims 1, 6 and 13 are the only independent claims in the application. The Appellant argues claims 1, 2, 4, 6, 7, 9 and 11-13 together. Therefore, we select independent claim 1 to decide the appeal regarding the rejections of claims 1, 2, 4, 6, 7, 9 and 11-13. See 37 C.F.R. § 41.37(c)(1)(vii)(2006). Accordingly, the claims 2, 4, 6, 7, 9 and 11-13 stand or fall with claim 1.

The Appellant separately challenges the rejection of dependent claims 14-16.

## THE CLAIMED SUBJECT MATTER

Claim 1 reads as follows:

1. A golf ball comprising a cover,

wherein the cover is made from a cover material including a cured product of thermosetting resin composition containing a thermosetting urethane resin composition;

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[1] Claims 3, 5, 8 and 10 have been canceled. (App. Br. 5).
[2] The real party in interest is SRI Sports, Ltd. (App. Br. 3).

the thermosetting urethane resin composition comprises an isocyanate group-terminated urethane prepolymer and a polyamine compound;

the isocyanate group-terminated urethane prepolymer contains an isocyanate component formed by at least one diisocyanate compound selected from the group consisting of 4,4'-dicyclohexylmethane diisocyanate, cyclohexane diisocyanate and isophorone diisocyanate;

the polyamine compound contains 3,3'-diethyl-5,5'-dimethyl-4,4'diaminodiphenylmethane;

the stiffness modulus of the cover material is 80 to 260 MPa; and

the stiffness modulus and shore D hardness of the cover material satisfy the following equation:
$2.0 \leq A/B \leq 5.0$, $40 \leq B \leq 55$
A: Stiffness modulus (MPa)
B: Shore D hardness.
(Claim 1, App. Br. Appendix A, at 41)

## THE EVIDENCE

The Examiner relies upon the following as evidence in support of the rejections:

| | | |
|---|---|---|
| Wu | US 5,908,358 | Jun. 01, 1999 |
| Iwami | JP2002-078824 | Mar. 19, 2002 |

## THE REJECTIONS

The following rejection is before us for review:

1. Claims 1, 2, 4, 6, 7, 9 and 11-16 stand rejected under 35 U.S.C. § 103(a) over the combination of Wu (US 5,908,358) and Iwami (JP2002-078824).

We AFFIRM as to claims 1, 2, 4, 6, 7, 9 and 11-13 and REVERSE as to claims 14-16.

## ISSUE

Has the Appellant established that the Examiner erred in determining that it would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare a golf ball having, inter alia, a ratio of the stiffness modulus and the shore D hardness of the golf ball to be between 2 and 5?

## FINDINGS OF FACT

The record supports the following findings of fact by a preponderance of the evidence.

1. Wu describes a golf ball having a cover produced from a thermosetting or thermoplastic polyurethane composition comprising an isocyanate-functional prepolymer and a curing agent comprising a polyamine or glycol, and an organic compound having at least one epoxy group, such as the diglycidyl ether of bisphenol A. (Wu Abstract; 2:37-43).

2. Wu's cover is therefore a "cover material including a cured product of thermosetting resing composition containing a thermosetting urethane resin composition." (Claim 1, App. Br, Appendix at 41).

3. Wu's cover is also therefore "an isocyanate group-terminated urethane prepolymer and a polyamine compound." (Claim 1, App. Br., Appendix at 41).

4. Wu describes that the Young's modulus, a measure of the stiffness of a material, of the cover is in the range of from 5,000 psi to 100,000 psi. (Wu 2:44-45; 5:10-11; Claim 1).

5. When converted to MPa, (psi/145.03777=MPa), Wu's disclosed range for the Young's modulus is approximately 34.5 to 689.5 MPa. (Final Rejection, Sep. 28, 2006 p. 2).

6. Wu therefore completely encompasses the claimed stiffness range of "80 to 260 MPa." (Claim 1, App. Br., Appendix A at 41).

7. Wu provides examples of the invention for which the golf ball covers have a Shore D hardness between 51 and 58. (Table 1).

8. Wu therefore describes a range within the claimed Shore D Harness of "$40 \leq$ [Shore D Hardness] $\leq 55$." (Claim 1, App. Br., Appendix A, at 41).

9. Converting Wu's described ranges to the same format as the ratio used in claim 1, Wu therefore describes the following relationship:

$$0.59^{3} \leq A/B \leq 13.51^{4}.$$

10. Wu also describes that the polyurethane prepolymer can be produced by reacting polyol and a diisocyanate. (Wu 5:34-36).

11. Wu describes that a thermoset polyurethane can be made from a diisocyanate, such as methylenebis-(4-cyclohexyl isocyanate), and a polyol which is cured with a polyamine. (Wu 5:44-47).

12. Wu also describes that alicyclic isocyanates can be used to produce the thermoset polyurethane. (Wu 5:39-50).

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[3] 34.5/58=0.59
[4] 689.5/51=13.51

13. Wu does not specifically require the isocyanate component to be formed from at least one diisocyanate compound selected from the group consisting of 4,4'-dicyclohexylmethane diisocyanate, cyclohexane diisocyanate and isophorone diisocyanate.

14. Wu does not specifically require the polyamine compound to contain 3,3'-diethyl-5,5'-dimethyl-4,4'diaminodiphenylmethane.

15. Iwami describes a golf ball having a polyurethane cover comprised of an isocyanate group terminated urethane prepolymer and a polyamine compound. (Iwami Abstract; [0011]).

16. Iwami describes that examples of a suitable isocyanate urethane prepolymer include 4,4'-dicyclohexylmethane diisocyanate and isophorone diisocyanate. (Iwami [0019]).

17. Iwami therefore specifically describes the "isocyanate component formed by at least one diisocyanate compound selected from the group consisting of 4, 4'-dicyclohexylmethane diisocyanate" (Claim 1, App. Br. Appendix A, at 41).

18. Iwami describes that suitable polyamine compounds include 4'-diamino diphenylmethane and its derivatives, e.g., 3, 3'-diethyl-5, 5'dimethyl -4, 4'-diamino diphenylmethane. (Iwami [0015], [0023], [0024], and [0026]).

19. Iwami therefore describes the formula encompassing among limited members the specific "polyamine compound contains 3, 3'-diethyl-5, 5'dimethyl -4, 4'-diamino diphenylmethane" (Claim 1, App. Br. Appendix A, at 41).

20. We read the claim limitation of "Shore D hardness" to reference the ASTM D2240 Standard Test Method, Type D, using a Shore Durometer.

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

The conclusion that the claimed subject matter is *prima facie* obvious must be supported by establishing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988).

ANALYSIS

Claim 1 recites the following elements, with parenthetical reference numerals added for ease of reference:

A golf ball comprising a cover,

(1) wherein the cover is made from a cover material including a cured product of thermosetting resin composition containing a thermosetting urethane resin composition;

(2) the thermosetting urethane resin composition comprises (2a) an isocyanate group-terminated urethane prepolymer and (2b) a polyamine compound;

(3) the isocyanate group-terminated urethane prepolymer contains an isocyanate component formed by at least one diisocyanate compound selected from the group consisting of 4,4'-dicyclohexylmethane diisocyanate, cyclohexane diisocyanate and isophorone diisocyanate;

(4) the polyamine compound contains 3,3'-diethyl-5,5'-dimethyl-4,4'diaminodiphenylmethane;

(5) the stiffness modulus of the cover material is 80 to 260 MPa; and

(6) the stiffness modulus and shore D hardness of the cover material satisfy the following equation:

(6a) $2.0 \leq A/B \leq 5.0$, (6b) $40 \leq B \leq 55$

A: Stiffness modulus (MPa)

B: Shore D hardness.

*The Examiner's Findings*

The Examiner found that Wu describes a golf ball having a cover made from (1) a thermosetting urethane resin composition comprising an (2a) isocyanate group-terminated urethane prepolymer and a (2b) polyamine compound. (Final Rejection, Sep. 28, 2006, p. 2).

The Examiner also found that Wu describes that the golf ball core has (5) a Young's modulus, i.e., a stiffness modulus, from about 5,000 to 100,000 psi, which is equivalent to 34.5 to 689.5 MPa. (Id.)

Additionally, the Examiner found that Wu describes examples of the invention in which (7) the golf ball covers have Shore D hardness values from 51 to 58. (Id.)(citing Wu Table 1).

While Wu describes that the cover composition comprises an isocyanate polyurethane, the Examiner found that Wu does not limit the polyurethane to the group of isocyanates recited in claim 1. (Id.). Similarly, the Examiner acknowledged that Wu describes using a 4,4'-diaminodiphenylmethane, but does not describe the polyamine specifically

as a 3,3'-diethyl- 5,5'-dimethyl- 4,4'-diaminodiphenylmethane, as recited in claim 1. (Id. at 2-3).

However, the Examiner also found that Iwami describes a golf ball having a cover comprising (3) a polyurethane composition made of an isocyanate group-terminated urethane prepolymer wherein the isocyanate may be 4,4'-dicyclohexylmethane diisocyanate or isophorone diisocyanate. (Id. at 3). According to the Examiner, Iwami describes that these isocyanates improve weatherability, water resistance and resilience. (Id.).

Additionally, the Examiner found that Iwami describes that the golf ball cover also comprises (4) a polyamine, such as 4'-diamino diphenylmethane and its derivatives, e.g., 3,3'-diethyl- 5,5' dimethyl -4,4'-diamino diphenylmethane. (Id.). The Examiner also found that Iwami describes that these polyamines improve thermal resistance. (Id.). Therefore, the Examiner concluded that a person of ordinary skill in the art would have found it obvious to select Iwami's isocyanate and polyamine as the isocyanate and polyamine comprising Wu's golf ball cover. (Id.).

According to the Examiner, selection of the disclosed stiffness modulus of at least 102 to 116 MPa and a disclosed Shore D hardness of 51 to 58 would satisfy the Applicants' claim limitations (6) requiring the cover material to have a stiffness modulus (A) of 80-260 MPa, a Shore D hardness (B) of 40-55, and to satisfy the equation: $2.0 \leq A/B \leq 5.0$. (Id.).

*The Appellant's Contentions*

A. The ratio of stiffness modulus to shore D hardness (element 6)

The Appellant first asserts that the claimed invention is not obvious because neither Wu nor Iwami disclose or suggest the relationship between

(6) the stiffness modulus (A) and shore D hardness (B) of the cover material as claimed, i.e., "the stiffness modulus and shore D hardness of the cover material satisfy the following equation: $2.0 \leq A/B \leq 5.0$, $40 \leq B \leq 55$." (App. Br. 14-15)(quoting Claim 1).

The Appellant is not entirely correct in their position. Wu describes a range of hardness and stiffness for his golf ball. (See FF 9, footnotes 2 and 3). Therefore, the issue, more aptly phrased, is whether the Appellant's claimed subject matter would have been obvious to one of ordinary skill in the art at the time the invention was made, knowing that Wu describes golf balls having hardness and stiffness ranges.

Cases from our reviewing court's predecessor indicate that this is the case. As stated in *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004),

> [W]here there is a range disclosed in the prior art, and the claimed invention falls within that range, there is a presumption of obviousness. But the presumption will be rebutted if it can be shown: (1) That the prior art taught away from the claimed invention, *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997); or (2) that there are new and unexpected results relative to the prior art, *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990).

Further, where general conditions of the appealed claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation, and the Appellant has the burden of proving any criticality. See *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955).

Consequently, we disagree that Wu does not teach a relationship of stiffness modulus and shore D hardness. The relationship that Wu teaches is a range that overlaps the Appellant's claimed range.

B. "Stiffness Modulus"

The Appellant's counsel states, without any evidentiary support, that:

> "Since Wu does not even recite stiffness modulus, it would be impossible to derive stiffness modulus for improving the controllability. Even if this value could be derived from Young's modulus, it is clear that the relationship between the stiffness modulus and the Shore D hardness could not be derived even if both references were considered in combination."

(App. Br. 15).

We are unpersuaded by this contention.

First, we observe that the term "stiffness modulus" is undefined in the specification. It is said to be measured by a Japanese test JIS K 7106)(Spec., page 15, lines 12-13). The Appellant has not supplied a translated copy of the standard with their brief, and we are unable to locate it within in the record on appeal to assist us in understanding the term "stiffness modulus." The specification does, however, inform the reader that stiffness modulus is measured in megaPascals (MPa) (Spec., p. 22, Table 2). This is the same dimension for Young's modulus.

We have been unable to find a recognizable standard definition for "stiffness modulus." The Appellant would have been in the best position to supply this information, and has declined to do so.

Second, this position is simply attorney argument. No persuasive evidence has been adduced to indicate why one of ordinary skill in the art

would be unable to determine a suitable range of "stiffness modulus" when given a range for the same dimensioned "Young's modulus."

The Examiner has found that Young's modulus is equatable to the claimed "stiffness modulus." It falls upon the Appellant to show that this finding is incorrect with sufficient evidence.

We additionally note that Young's modulus appears to be a measure of stiffness known in the art. See, e.g. The Condensed Chemical Dictionary, 8th Edition, 1971, pp. 590, (Attached) which recites:

> **Modulus of elasticity** (elastic modulus). A coefficient of elasticity representing the ratio of strain to stress as a material is deformed under dynamic load. It is a measure of the softness or **stiffness** of the material (Young's modulus). Typical values of Young's modulus for a stress of 100,000 lbs/ sq in are carbon steel, 300, copper 170, soda-lime glass 100, polystyrene 5, graphite 1. (emphasis added)

We have been provided with no credible explanation why would it be impossible for one of ordinary skill in the art to select a given stiffness modulus from a known Young's modulus. Indeed, we presume one of ordinary skill in the art would understand the interrelated nature of these moduli, as indicated by the industry-standary Chemical Dictionary.

We therefore conclude the Appellant has not shown that the Examiner erred in determining stiffness modulus based upon a known Young's modulus.

Accordingly, we find this second argument unpersuasive.

C. The Comparative Examples and Results

The Appellant next urges that the specification describes comparative examples that reflect Wu's ranges and demonstrate that Wu "fails to provide any reasonable suggestion towards obtaining the present invention such that

one of ordinary skill in the art would have to engage in undue experimentation without sufficient guidance." (App. Br. 15-16).

We disagree with the initial assumption that Wu does not suggest the subject matter of the instant claim. Wu has values which overlap the claimed values. It is incumbent upon the Appellant to show any criticality of the claimed values.

Also unconvincing is the Appellant's assertion of comparative examples of golf balls 8 to 16 as examples of Wu balls which the specification states have certain negative characteristics, such a low controllability, poor shot feeling, short flight distances, and poor abrasion resistance. (App. Br. 16). While this information is interesting, what is missing from the argument is persuasive evidence that these results reflect truly unexpected properties resulting from the Appellant's specifically claimed range rather than a simple optimization of result effective variables.

The Appellant's counsel states that "even if the Young's modulus and the Shore D hardness of Wu could be applied to a golf ball cover as presently claimed, the unexpected and remarkable results of the presently claimed invention would not be achieved unless the cover were made to have a Shore D hardness of 40 to 55 and unless the ratio of the stiffness modulus were made to be within the range of 2.0 to 5.0." (App. Br. at 18, 27-28).

We have looked at Tables 2 and 3 and note that they do appear to show a difference. Table 2 shows numerous "E" and "G" results for balls within the claimed ranges, while Table 3 illustrates far fewer "E" and "G" measurements, along with some "P" measurements on controllability and

shot feeling. However, the nature of these results (expected or unexpected) is insufficiently explained to be able to overcome the obviousness of the claimed subject matter.

Specifically, there is insufficient evidence to back up the Appellant's argument that these remarks are either unexpected or remarkable. Why would one of ordinary skill in the art be surprised that these selections of hardness and stiffness would have these properties? We see nothing surprising in the observation that really hard and stiff golf balls (8, 11) have poor shot feel and controllability. Likewise, we are also unsurprised that softer and less stiff golf balls (9, 10) have better controllability and shot feeling, but carry less far. The claimed ratio covers the middle of the ranges, which appears to give expectedly better results.

Accordingly, we are unpersuaded by this argument as well.

D. Cover Thickness

The Appellant also separately challenges the Examiner's rejection of dependent claims 14-16, asserting that these claims "further limit claims 1, 6, and 13, respectively to a golf ball cover having a thickness of from 0.2 to 1.5 mm and is supported in the specification at, for instance, page 10." (App. Br. 36)(quoting Specification p. 10).

The Examiner found that Wu describes a cover having a thickness of about 1.3 mm (Final Rejection, Sep. 28, 2006, p. 3)(citing Wu, Table 1). Although the Appellant has not specifically challenged this finding, we are unable to determine where the evidentiary support for this finding lies. Accordingly, we reverse this rejection as it applies to claims 14-16,

E. Motivation – Wu and Iwami

The Appellant next contends that a motivation to combine the teachings of Wu and Iwami to arrive at the inventions recited in claims 1, 6 and 13 is neither provided by the references nor the state of the art. (App. Br. 19).

The Appellant asserts that "Wu only discloses a very large range of relationships between Young's modulus and hardness," and does not "lead one of ordinary skill in the art to specfically select the recited range of the modulus or 102-116 MPa or that this particular range could yield the results of the present invention from within this extremely broad range of variables having unpredictable outcomes." (App. Br. 20).

This argument is not persuasive. As we discussed, supra, "where there is a range disclosed in the prior art, and the claimed invention falls within that range, there is a presumption of obviousness." *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004). Here, as the Appellant acknowledges, the range of the modulus 102-116 MPa recited in the claims is encompassed in the range disclosed by Wu, i.e., 34-689.5 MPA. (App. Br. 20).

Thus a presumption of obviousness exists. Moreover, as discussed supra, where general conditions of a claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980).

Consequently, we do not find that the Examiner erred in determining that it would have been obvious to a skilled artisan at the time of the invention to discover an optimum range of Wu's disclosed modulus by routine experimentation.

F. Selection of 3,3'-diethyl-5,5'-dimethyl-4,4'diaminodiphenyl methane (claims 1, 6 and 13).

In the final rejection, the Examiner found that that Iwami describes a golf ball cover of a polyurethane composition made of an isocyantate group-terminated urethane prepolymer and a polymamine. The Examiner stated that "the polyamine desired is 4'-diamino diphenylmethane and derivatives thereof where 3,3'-diethyl- 5,5' dimethyl -4,4'-diamino diphenylmethane is noted as being a derivative thereof." (Final Rejection, Sep. 28, 2006, p. 3)(internal citation omitted).

The Appellant does not dispute that Iwamin discloses the precise curing agent recited in the claims. Yet, the Appellant asserts that there is no motivation in the prior art to select 3,3'-diethyl- 5,5' dimethyl -4,4'-diamino diphenylmethane, as claimed, because "the Examiner's reference to this broad disclosure in Iwami et al. is insufficient." (App. Br. 21-22). Specifically, the Appellant argues that Iwami's disclosure is "broadly encompassed by [a] vague disclosure...." (Id. 21).

We are also not persuaded by this argument. A reference is good for everything it teaches. See *In re Azorlosa*, 241 F.2d 939, 941 (CCPA 1957), (it is proper for the court and necessarily, the board, to consider everything that a reference discloses). While the Appellant's counsel has characterized the disclosure of 3,3'-diethyl- 5,5' dimethyl -4,4'-diamino diphenylmethane as "vague" in Iwami, the disclosure nonetheless describes to one of ordinary skill in the art the known addition of the compound as a desired polyamine in the polyurethane composition for a golf ball cover.

Consequently, the Examiner's finding articulates reasoning supported with rational underpinnings describing why a skilled artisan at the time of the invention would have selected Iwami's 3,3'-diethyl- 5,5' dimethyl -4,4'-diamino diphenylmethane as the curing agent in the golf ball cover described by Wu. See *In re Kahn*, 441 F.3d 977, 988-89 (Fed. Cir. 2006).

G. "Teaching Away"

The Appellant also contends that Wu teaches away from the claimed invention. (App. Br. 22-25).

The Appellant next asserts that Wu teaches away from the claimed invention by describing the use of an epoxy curing agent in the polyurethane composition of the golf ball cover. (Id. 22). Apparently referring to dependent claims 11 and 12 (App. Br. 35) and independent claim 13 and its dependent claims, the Appellant asserts that the claim languange describing that "the thermosetting urethane resin composition *consists essentially of* an isocyanate group-terminated urethane prepolymer and a polyamine compound" (Claim 13, App. Br. 44)(emphasis added) excludes the addition of an epoxy curing agent, contrary to the disclosure in Wu. (Id. 22-25).

This argument is also unpersuasive. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley* 27 F.3d 551, 553 (Fed. Cir. 1994).

Wu describes, "Preferably; a golf ball is made in accordance with the present invention by molding a cover about a core wherein the cover is formed from a polyurethane composition comprising a polyurethane

prepolymer and a slow-reacting polyamine curing agent or a bifunctional glycol and an epoxy curing agent." (Wu 6:15-20). This disclosure does not require a finding that it "teaches away" from the "consists essentially of" limitation of claim 13. As the Federal Circuit has stated,

> "Consisting essentially of" is a transition phrase commonly used to signal a partially open claim in a patent. Typically, "consisting essentially of" precedes a list of ingredients in a composition claim or a series of steps in a process claim. By using the term "consisting essentially of," the drafter signals that the invention necessarily includes the listed ingredients and is *open to unlisted ingredients that do not materially affect the basic and novel properties of the invention.* A "consisting essentially of" claim occupies a middle ground between closed claims that are written in a "consisting of" format and fully open claims that are drafted in a "comprising" format.

*PPG Industries v. Guardian Industries Corp.*, 156 F.3d 1351, 1354 (Fed. Cir.1998)(emphasis added). Thus, claim 13 is open to unlisted ingredients, such as an epoxy curing agent, if the ingredient does not materially affect the basic and novel properties of the invention. As the Examiner stated (Ans. 7), the Appellant's specification describes that '[t]he urethane resin composition may contain *any known catalyst* for use in a urethane reaction *in addition to* the isocyanate group-terminated urethane prepolymer and the polyamine compound described above," (Specification 9:9-12)(emphasis added). Consequently, Wu's disclosure of a composition additionally comprising a known catalyst, i.e., an epoxy curing agent, is not excluded by claim 13 and does not teach away from the invention.

Therefore, we do not find that the Appellant has established error on the part of the Examiner.

H. "Hindsight"

The Appellant contends that the Examiner employed improper hindsight. (App. Br. 25-27).

The Appellant further asserts that "the Examiner has failed to establish a prima facie case of obviousness because the Examiner is participating in improper hindsight reconstruction in using Appellant's own claims as a template on which to assemble unrelated disclosures and references." (Id. 27).

We disagree, as the Court explained in *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971), "Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning . . . ." The Court further clarified that such a reconstruction is proper if it relies on ordinary skill at the time of the invention and not on knowledge gained solely from the Applicant's disclosure. *Id.* As discussed, supra, the cited combination of references disclose all of the limitations of the claims and it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references to make the claimed invention. Specifically, it would have been obvious for a skilled artisan to select the 3,3'-diethyl- 5,5' dimethyl -4,4'-diamino diphenylmethane desired polyamine in Iwami's polyurethane golf ball cover as the polyamine in the urethane composition comprising the golf ball cover described by Wu. Accordingly, we do not find that the Appellant has established error on the part of the Examiner.

We therefore AFFIRM-IN-PART the Examiner's rejection.

## CONCLUSION OF LAW

On the record before us, the Appellant has not shown error on the part of the Examiner regarding the rejection of claims 1, 2, 4, 6, 7, 9 and 11-13. It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare a golf ball having, inter alia, a ratio of the stiffness modulus and the shore D hardness of the golf ball to be between 2 and 5.

Regarding claims 14-16, we find that the Examiner did not provide sufficient evidence to support the rejection of those claims.

## DECISION

The Rejection of claims 1, 2, 4, 6, 7, 9 and 11-13 under 35 U.S.C. §103(a) as being unpatentable over Wu and Iwami is AFFIRMED.

The Rejection of claims 14-16 under 35 U.S.C. §103(a) as being unpatentable over Wu and Iwami is REVERSED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1) (iv) (2006).

AFFIRMED-IN-PART

qsg

RICHARD E. SCHAFER, Administrative Patent Judge.

I concur in the result.

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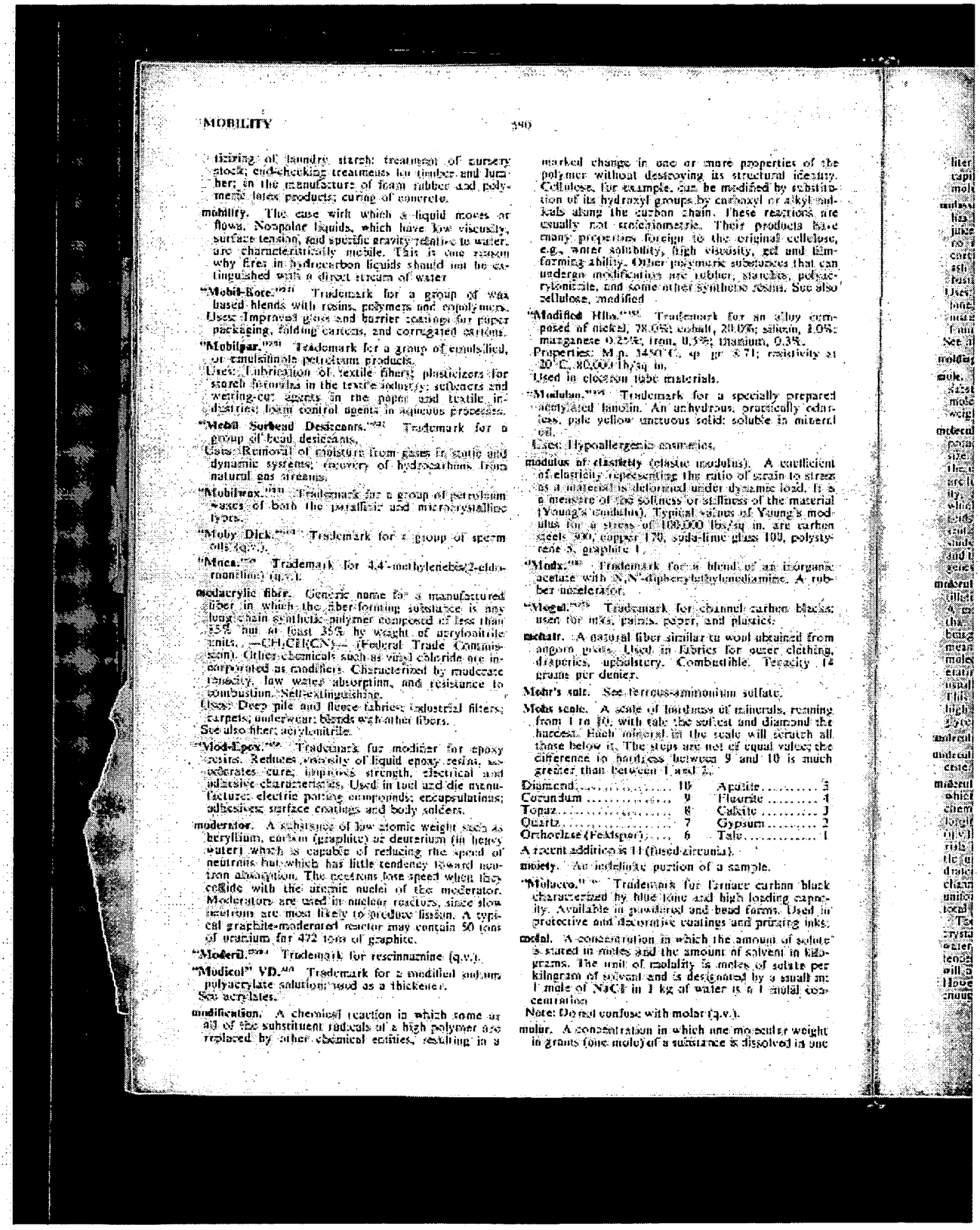



fixing of laundry starch; treatment of nursery stock; end-checking treatment for timber and lumber; in the manufacture of foam rubber and polymeric latex products; curing of concrete.

**mobility.** The ease with which a liquid moves or flows. Nonpolar liquids, which have low viscosity, surface tension, and specific gravity relative to water, are characteristically mobile. This is one reason why fires in hydrocarbon liquids should not be extinguished with a direct stream of water.

**"Mobil-Kote."**[US] Trademark for a group of wax based blends with resins, polymers and copolymers.
Uses: Improved gloss and barrier coatings for paper packaging, folding cartons, and corrugated cartons.

**"Mobilpar."**[US] Trademark for a group of emulsified, or emulsifiable petroleum products.
Uses: Lubrication of textile fibers; plasticizers for starch formulas in the textile industry; softeners and wetting-out agents in the paper and textile industries; foam control agents in aqueous processes.

**"Mobil Sorbead Desiccants."**[US] Trademark for a group of bead desiccants.
Uses: Removal of moisture from gases in static and dynamic systems; recovery of hydrocarbons from natural gas streams.

**"Mobilwax."**[US] Trademark for a group of petroleum waxes of both the paraffinic and microcrystalline types.

**"Moby Dick."**[US] Trademark for a group of sperm oils (q.v.).

**"Moca."**[US] Trademark for 4,4'-methylenebis(2-chloroaniline) (q.v.).

**modacrylic fiber.** Generic name for a manufactured fiber in which the fiber-forming substance is any long-chain synthetic polymer composed of less than 85% but at least 35% by weight of acrylonitrile units, —$CH_2CH(CN)$— (Federal Trade Commission). Other chemicals such as vinyl chloride are incorporated as modifiers. Characterized by moderate tenacity, low water absorption, and resistance to combustion. Self-extinguishing.
Uses: Deep pile and fleece fabrics; industrial filters; carpets; underwear; blends with other fibers.
See also fiber; acrylonitrile.

**"Mod-Epox."**[US] Trademark for modifier for epoxy resins. Reduces viscosity of liquid epoxy resins, accelerates cure, improves strength, electrical and adhesive characteristics. Used in tool and die manufacture; electric potting compounds; encapsulations; adhesives; surface coatings and body solders.

**moderator.** A substance of low atomic weight such as beryllium, carbon (graphite) or deuterium (in heavy water) which is capable of reducing the speed of neutrons but which has little tendency toward neutron absorption. The neutrons lose speed when they collide with the atomic nuclei of the moderator. Moderators are used in nuclear reactors, since slow neutrons are most likely to produce fission. A typical graphite-moderated reactor may contain 50 tons of uranium for 472 tons of graphite.

**"Moderil."**[US] Trademark for rescinnamine (q.v.).

**"Modicol" VD.**[US] Trademark for a modified sodium polyacrylate solution; used as a thickener.
See acrylates.

**modification.** A chemical reaction in which some or all of the substituent radicals of a high polymer are replaced by other chemical entities, resulting in a marked change in one or more properties of the polymer without destroying its structural identity. Cellulose, for example, can be modified by substitution of its hydroxyl groups by carboxyl or alkyl radicals along the carbon chain. These reactions are usually not stoichiometric. Their products have many properties foreign to the original cellulose, e.g., water solubility, high viscosity, gel and film-forming ability. Other polymeric substances that can undergo modifications are rubber, starches, polyacrylonitrile, and some other synthetic resins. See also cellulose, modified.

**"Modified Hiltx."**[US] Trademark for an alloy composed of nickel, 28.0%; cobalt, 28.0%; silicon, 1.0%; manganese 0.25%; iron, 0.5%; titanium, 0.3%.
Properties: M.p. 1450°C, sp gr 8.71; resistivity at 20°C, 80,000 lb/sq in.
Used in electron tube materials.

**"Modulan."**[US] Trademark for a specially prepared acetylated lanolin. An anhydrous, practically odorless, pale yellow unctuous solid; soluble in mineral oil.
Uses: Hypoallergenic cosmetics.

**modulus of elasticity** (elastic modulus). A coefficient of elasticity representing the ratio of strain to stress as a material is deformed under dynamic load. It is a measure of the softness or stiffness of the material (Young's modulus). Typical values of Young's modulus for a stress of 100,000 lbs/sq in. are carbon steels 300, copper 170, soda-lime glass 100, polystyrene 3, graphite 1.

**"Modx."**[US] Trademark for a blend of an inorganic acetate with *N,N'*-diphenylethylenediamine. A rubber accelerator.

**"Mogul."**[US] Trademark for channel carbon blacks; used for inks, paints, paper, and plastics.

**mohair.** A natural fiber similar to wool obtained from angora goats. Used in fabrics for outer clothing, draperies, upholstery. Combustible. Tenacity 14 grams per denier.

**Mohr's salt.** See ferrous-ammonium sulfate.

**Mohs scale.** A scale of hardness of minerals, running from 1 to 10, with talc the softest and diamond the hardest. Each mineral in the scale will scratch all those below it. The steps are not of equal value; the difference in hardness between 9 and 10 is much greater than between 1 and 2.

| | | | |
|---|---|---|---|
| Diamond | 10 | Apatite | 5 |
| Corundum | 9 | Fluorite | 4 |
| Topaz | 8 | Calcite | 3 |
| Quartz | 7 | Gypsum | 2 |
| Orthoclase (Feldspar) | 6 | Talc | 1 |

A recent addition is 11 (fused zirconia).

**moiety.** An indefinite portion of a sample.

**"Molacco."**[US] Trademark for furnace carbon black characterized by blue tone and high loading capacity. Available in powdered and bead forms. Used in protective and decorative coatings and printing inks.

**molal.** A concentration in which the amount of solute is stated in moles and the amount of solvent in kilograms. The unit of molality is moles of solute per kilogram of solvent and is designated by a small *m*: 1 mole of NaCl in 1 kg of water is a 1 molal concentration.
Note: Do not confuse with molar (q.v.).

**molar.** A concentration in which one molecular weight in grams (one mole) of a substance is dissolved in one